

Applicants: Lincoln *et al.*
Serial No.: 09/618,178
Filed: July 18, 2000
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48. (New) A method of determining both genotype and confidence scores at a genetic locus for a plurality of samples of genetic material obtained from a subject and wherein the plurality of samples have been prepared under comparable conditions, comprising:

- B1
- (a) assembling input signals from each sample in a Euclidean representation;
 - (b) determining the initial conditional probability for each input signal in the Euclidean representation for each genotype;
 - (c) computing a conditional probability of each genotype for each input signal, and
 - (d) determining the genotype and confidence score for each input signal, thus determining the genotype and confidence score at the genetic locus for each sample.

49. (New) A method according to claim 48, wherein the input signals are reaction values.

50. (New) A method according to claim 48, wherein the Euclidean representation is a two dimensional plot of a first reaction value on the x axis and a second reaction value on the y axis.

D 51. (New) A method according to claim ⁷²~~49~~, wherein the reaction values are measurements of an optical signal or a digital image intensity value.

D 52. (New) A method according to claim ⁷⁴~~50~~, wherein the reaction values are measurements of an optical signal or a digital image intensity value.

53. (New) A method according to claim 51, wherein the optical signal is an optical density.

54. (New) A method according to claim 52, wherein the optical signal is an optical density.

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55. (New) A method according to claim 48, wherein the input signals are a combination of two reaction values.

56. (New) A method according to claim ⁷²~~49~~, wherein the reaction values are obtained by assaying for alleles using a method selected from the group consisting of genetic bit analysis, hybridization, allele-specific amplification and a ligase chain reaction.

57. (New) A method according to claim 56, wherein the reaction values are obtained by assaying for alleles using genetic bit analysis.

58. (New) A method according to claim ⁷⁴~~50~~, wherein the reaction values are obtained by assaying for alleles using a method selected from the group consisting of genetic bit analysis, hybridization, allele-specific amplification and a ligase chain reaction.

59. (New) A method according to claim 58, wherein the reaction values are obtained by assaying for alleles using genetic bit analysis.

60. (New) A method according to claim ⁷²~~48~~, further comprising detecting the presence of a downward trend in confidence scores over time.

61. (New) A method according to claim ⁷²~~60~~, further comprising triggering an alarm condition upon detecting a statistically significant downward trend in confidence scores over time.

62. (New) A method according to claim ^{7a}~~49~~, wherein the reaction values are obtained by assaying for one or more alleles that provide information relating to a trait.

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D 63. (New) A method according to claim ⁷⁴~~50~~, wherein the reaction values are obtained by assaying for one or more alleles that provide information relating to a trait.

D 64. (New) A method according to claim ^{7a}~~49~~, wherein one or more of the reaction values are obtained by assaying for one or more alleles that provide information pertaining to parentage of the subject.

B1 cont 65. (New) A method according to claim ⁷⁴~~50~~, wherein one or more of the reaction values are obtained by assaying for one or more alleles that provide information pertaining to parentage of the subject.

66. (New) A method according to claim ^{7a}~~48~~, wherein more than one genetic loci are analyzed.

P 67. (New) A method according to claim ^{7a}~~49~~, wherein the reaction values are obtained by assaying for one or more alleles that provide information useful for determining the identity of the subject.

D 68. (New) A method according to claim ⁷⁴~~50~~, wherein the reaction values are obtained by assaying for one or more alleles that provide information useful for determining the identity of the subject.

69. (New) A method of determining for a plurality of samples analyzed with comparable biochemistry a genotype and confidence score for the genotype at a locus within genetic material, comprising:

(a) measuring, under comparable conditions, a first reaction value for each sample, indicative of the presence of a given allele at the locus;